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RIVERS AND HARBORS.

SPEECH

OF

HON. CLIFTON R. BRECKINRIDGE,

OF ARKANSAS,

IN THE

HOUSE OF REPRESENTATIVES,

TUESDAY, FEBRUARY 3, 1885.



WASHINGTON.

1885.

S P E E C H
OF
HON. CLIFTON R. BRECKINRIDGE.

The House being in Committee of the Whole on the state of the Union, and having under consideration the bill (H. R. 8130) making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes—

Mr. BRECKINRIDGE said:

Mr. CHAIRMAN: When the river and harbor bill was reported to the House I gave notice of my intention to bring in a minority report. I have been unable to write out that report; but in the course of my remarks I will bring before the House the propositions it would contain. I did not contemplate a dissent from anything in the bill reported by the committee, but an addition to the bill.

The committee made no appropriations for harbors upon the Mississippi River below Cairo. They made a proportionable appropriation for the river below Cairo as a unit; but they left out those additional recommendations of the commission for the respective harbors to which I refer.

It is of the utmost importance to the people of this country, and especially to those north of Cairo, that the unity of the plan of treating the river should not be interfered with. This is enforced from every source. If the appropriations are broken up into disconnected parts it destroys all continuous and contiguous treatment of the river. This, I say, can not be permitted by the great States north, east, or west of Cairo. The House knows very well that the river below Cairo is not being improved for the benefit of the sparse population upon its banks, but for the benefit of the whole Mississippi Valley, of which the lower part is the least part. There are, however, certain cities of commercial importance situated upon the banks of the lower river, and it can not be expected that the commercial interests centering at these points will be wholly unmindful of their own necessities and rights.

But the proposition has been brought forward that these ports are not harbors in the usual and commercial sense. This can never be agreed to. Over against it I lay the maintained policy of Congress in cases almost without number. The position of the committee is illogical, unusual, unjust, and unfortunate.

It was only last year that an appropriation was made for the Missouri River as a river. Before that the appropriations were for the improvement exclusively of the harbors upon that river; and all along the line of Congressional action we have these appropriations for the interior harbors of the country.

I consider, sir, that a harbor like that at the city of Memphis has a stronger claim upon Congress for attention than even those upon our seaboard. For instance, take the harbor at New York. The improve-

ments there enter in no wise into the general plan of improvement to connect the Atlantic Ocean with Albany, while, on the contrary, an appropriation for the improvement of these harbors upon the Mississippi River, and I cite again the Memphis Harbor, are appropriations for improvements that will in all human probability, in due time, be links in the general system of the river improvement. There is not a dollar expended nor a lick of work done that is not expended and done where only general river improvement is carried on. It all would be done here in time anyway. The only question is, shall we do it a little quicker than we would in the ordinary course of events? And yet in the face of a settled question and in the face of this peculiar strength gentlemen hesitate. And why?

They say that in due time the general river improvement will cover the case. This is true; but this is selfish in our Northern friends to make us wait and suffer until we are relieved only as a tardy incident to their relief.

They say that such improvements would benefit private property. That is true; but if that is an unavoidable incident in the discharge of our bounden duty, should it grieve us? Why should that confuse our minds? I know the doctrine of riparian rights and risks. It is sound. But there is another question in this case. This is not a river landing, where a planter hauls cotton from his gin-house a few hours before the steamboat is due. This is the city to which he ships. This is the city to which not only he ships, but also to which hundreds of thousands of other people in the interior and among the uplands and mountains ship their produce, and from which they get their merchandise and manufactured goods of all kinds.

Here are the railroad centers. Here are the warehouses, the cotton compresses, the paved wharfs, the railroad inclines, and all the other needs and appurtenances of commerce. If these are destroyed the people who own them are losers. There is no doubt about that. But is not one else a loser? Is commerce not affected by the broad fundamental fact that it can no longer have a port here? It must either stand in its charges the expense of these risks or else it must go by rail to distant ports where stability is found, and of course that makes an equal charge upon the commerce. This may suit the railroads, but it will not pay the farmers and merchants. Who can gainsay this?

It is questionable whether Congress would sit still and see a city like Memphis, the second city of the South, for Louisville is hardly Southern, plunge headlong into the Mississippi River and be lost forever. As a case of urgency and distress the American heart would respond to it. Who would say no? We would curb the great river that we only have charge of and save the happy homes of 75,000 people.

But we do not need to go to this. This is not like a plantation landing. The landing may be swept away and the planter would want only a landing still. The untouched river bank is all he wants. But here are certain great centers, scattered over a thousand miles of river, and commerce must find stability there for its assembled needs, or else the thousands must pay tribute to less fortuitous conditions. The river is but little to these people if they can not do business upon its banks. I appeal to you then, gentlemen from the North, not to see only your own interests, not to disregard these righteous claims, and not to provoke a desperate struggle between yourselves and the commercial interests of the lower States.

And now there are two other points that I want to speak about as

briefly as I can. In the first place I wish to speak of a few engineering features in connection with the Galveston Harbor improvement. As is known by this House we propose to throw overboard work there that has cost nearly \$2,000,000, or at least what little is left of it, and to change the entire management of the work at that place. This is a very grave reflection upon the military engineers who have charge of this work, and there must be very grave reasons for so radical a step. I am one of those who believe that reasons exist not only sufficient to justify the proposed step but sufficient to make it absolutely obligatory upon us.

The Government work was begun there ten years ago. The survey and plans are given in the report of 1874. At an expenditure of several hundred thousand dollars a jetty of gabions was extended from what is known as Bolivar Point into the Gulf. General Newton figures it out in his letter to our committee that this gabionnade cost \$169,000. Senator COKE, in the very able report he made to the Senate on behalf of the Commerce Committee of that body, figures the cost at \$527,000. It is not easy from the Engineer's report to fix the exact amount; but I have figured it up twice, and it is certain, if the reports be correct, that General Newton is far too low, and I am very much inclined to think that Senator COKE is too low.

It was expected, as you will see on page 867 of report of 1875 and on page 447 of report of 1877, that this north jetty would secure the desired depth of water there. However, nature has rebuked the disregard of her laws and the gabionnade is gone. There is not a vestige of the structure left. This was not due to quicksand or to any such cause. The gabions were no account to begin with, and had they been strong they would have been lost just the same. They exemplified what is known as the submerged jetty, a novel species of structure that we are largely engaged in and with apparently no earthly sign of stability or success.

I have taken occasion, sir, to read the accounts of all the sea works in the world on the jetty plan that I could find, and I have a long list of them, and never was there any work of that kind undertaken, nor, indeed, was it ever suggested that I have been able to learn except once. The single suggestion that I speak of was in the course of the consultations of engineers and others with reference to the improvement of the mouth of the Danube. Sir Charles Hartley, the engineer in charge, stated that the plan of submerged jetties was "actually proposed to the commission by one of its technical advisers." It permitted the very force you propose to conserve to be dispersed and lost, for your only hope of power is in controlling the surface slope, which controls the currents at all depths, and they would serve no other purpose than that of "dangerous submarine reefs."

I respectfully refer those who may not have read the interesting paper I quote from to page 287, volume 21, Proceedings Institution Civil Engineers, London, to be found in the national library.

That plan was adopted at Galveston by what is known as the gabionnade system. What is a gabion? A gabion is nothing but a huge lunch basket that is cemented on the outside as you cement the inside of a cistern, and that basket is filled with sand, is put in position, and was supposed to be irresistible to storms. These gabions did resist the storms, so far as being broken up is concerned, much better than they resisted some of the other effects of the storms and the effects of tidal currents. Being submerged, and the tides and waves sweeping over them with a dangerous overfall current, they were undermined. Foot-

mats did not save them. The conclusion is well stated in the report of 1880, page 1226, where it says: "In fact, the gabionnade has essentially gone down below the original bottom."

And so they are gone, and that folly has not even its monument left. That would seem to have demonstrated the futility of putting down submerged jetties, for this submerged jetty was not undermined because it had the name of "gabionnade." No other name would have saved it.

In 1880 a new method of construction was adopted. Captain Howell was replaced with Major Mansfield, the present officer in charge. What is known as the fascine system, a partial copy of the Dutch works at the mouth of the Maas, was adopted. But the copy is like "Hamlet with Hamlet left out." The Dutch works are high. These are to be submerged. The Maas has silt to protect the fascines. These have no hope of mud to protect them from the teredo, a most destructive sea-worm. And as for gathering sand, our last submerged jetty did not collect sand, as expected. It was left "standing in a trench without sand." How can this fare better when it is substantially the same shape and height? They seem to be repeating in principle, though in a little different form, the same error that was committed before.

Over \$1,000,000 has been put out on this new work, and the people of Texas continued to pin their hope to the plan. That has gone on, sir, until it has been projected now some four and a quarter miles into the Gulf. All the prophecies with reference to it have failed.

There were plenty of prophecies of what would be the result of the present jetty at the different stages of its progress—prophecies of depth, of durability, and all that. I will treat of these more particularly later on. The people of Galveston put \$100,000 of their own money into the work. But after severe disappointments and about nine years of trial they threw up the case, and last session the entire delegation from Texas, a delegation conspicuous for its ability and high character, told us frankly that further work upon this system was in their opinion a waste of time and money.

Now the question is, have we enough to satisfy us? But we must go further in our examination of the work and of the men who have control of it. This will help us to come to a right conclusion as to whether one or both should be put aside. Judging as laymen, we must be largely influenced by our confidence in the men. I will call attention to some of the statements of the engineers.

You will find, sir, in the printed remarks of my colleague on the committee, General BAYNE, of Pennsylvania, a letter from Colonel Merrill, an officer of the military Engineer Corps, and who seems now to be a spokesman in this matter.

Colonel Merrill states that both the Chief of Engineers and the resident engineer deny that the north jetty has yet been located.

Now, in reference to that, I want to call the attention of the House to page 1225 of the report of the Chief of Engineers for 1880. It reads:

From its commencement, April 14, 1877, to January 1, 1880, the Bolivar pier—

Which is the north one—

had been extended seaward from the beach 10,220 feet.

Now that statement is signed by General Newton himself, the present Chief of Engineers, who is quoted by Colonel Merrill as denying that this jetty has ever been located.

I can not comprehend, Mr. Chairman, how about two miles of this north jetty could be built, running through nearly three years, without

having been located. Nor can I understand how such a statement as has been presented to us can be thus solemnly certified to Congress for its guidance. Was anybody cashiered or complained of for that immense expenditure of the public funds in an unauthorized way? No, sir; and there was no occasion to do it, for it was on an accepted line. I have quoted from the last report of the board of engineers, and if you will look at their first report, in 1874, you will see that they therein make revised estimates for both the north and south jetty projected toward the outer bar, and they raise Captain Howell's estimate \$635,401.50, making the total \$1,759,401.85, instead of \$1,124,000.35. The chart is referred to as showing the "parallel jetties," and the board takes no exception to that location, nor does it suggest any change. This report also is signed by General Newton himself. It is in the face of these facts and of many more like them, running all through the reports, that "both the Chief of Engineers and the engineer in charge deny that the north jetty has ever been located."

I will call attention to one other proof. Here is the chart with the report of 1880. It is the official map of the engineer in charge, Colonel Mansfield, with his signature upon it, and it is under these words: "Showing lines of proposed jetties." This chart is sent to Congress by the then Chief of Engineers, and it is in Colonel Mansfield's report dated July 17, 1880, just thirty-seven days after the report of the board, of which General Newton was a member, and which gave advice to the Engineering Department to help it to a final conclusion. After it has been all digested we have this map, which the Chief of Engineers publishes with his report and without comment. Yet the north jetty is not located. I shall have occasion to refer to this map again, as well as to some of the very ample statements in this report about both of the jetties.

Thus you see both of these gentlemen are frequently and in the most conspicuous manner refuted by point-blank testimony over their own signatures.

Mr. WHITE, of Kentucky. May I ask the gentleman from Arkansas [Mr. BRECKINRIDGE] to give the date of that first statement?

Mr. BRECKINRIDGE. The date is not given, but Mr. BAYNE introduced it in his speech here on Saturday, and its general tenor indicates that it has been written quite recently.

Mr. BAYNE. I think you will find that it bears the date of January 21, 1885.

Mr. BRECKINRIDGE. It is certainly in this year. The date of the first statement from the reports is several years ago, during the progress of the work.

Mr. SPRINGER. If I do not interrupt the gentleman, I would like to ask him whether, in these comparisons that he is making, he may not be confusing the inner with the outer harbor?

Mr. BRECKINRIDGE. No, sir. The north jetty has nothing to do with the inner harbor. There is no possibility of that construction. The whole argument is predicated upon this plan, and here are the lines projected into the Gulf and drawings of cross-sections and all that.

Now, there is another statement made by the engineers, which goes to show how these gentlemen are dealing with this work, and how much confidence we can have that they know what they are about or that they would ever do any good there.

This statement is in regard to the width between jetties. This officer (Colonel Merrill) says that the statement that the width is to be two

and one-fourth miles between the jetties is positively denied by the Chief of Engineers and by the resident engineer. We can only go upon the data given us by the Chief of Engineers, through the War Department, and sent here for our guidance.

Now, sir, here is this chart, indorsed by the final authority and after counsel, and the width is given. It is no "study" map, and is not so given. You see by it that the outer ends are 12,200 feet apart, considerably more than two and one-fourth miles. The inner ends are somewhat wider. Here are the dividers [producing them], and I invite any gentleman to come here and take the measurement for himself and look at this chart.

Again, it is stated by this gentleman that the statement that there were to be outlets or gaps in the jetties is entirely untrue, that nothing of the kind is mentioned. He says, "I can find no authority for the existence of these outlets." I will only ask the House to look at the printed statements on that point. Colonel Mansfield states in his last report to Congress, which was under the eye of this engineer, that upon the chart he has shown the line of the north jetty—which of course is another place where the north jetty is located. But I am now discussing the question of outlets. I read from part 2, page 1298, report of 1884:

Upon the chart is shown the line of the north jetty, as I propose. It is to project from a point abreast the 26-foot depth in Bolivar Channel to 25-foot depth in the Gulf, &c.

Now, take the 26-foot point in Bolivar Channel and measure from that back to the shore, and you will find that it is over 6,000 feet out from the shore, leaving conclusively a gap of largely over a mile in extent. I furthermore state that while I have not seen the chart since it was sent to the Chief of Engineers, for our present advanced set of the report does not contain it, yet I did see it when I was in Galveston last fall, where I went in compliance with a promise I had made to the Texas delegation that I would go and examine into their wants. When I was in Galveston I saw the proposed chart and it showed a gap of apparently several thousand feet between the shore and the inner end of the north jetty. But the statement I have quoted shows it, and of course the chart referred to is in the office of the Chief of Engineers and was examined by this officer as he states. Then on page 1414—report of 1882—the board says: "It seems probable that they (the jetties) must be connected with the shore." Do these things indicate gaps or outlets?

The next question is as to the height of these jetties. It should be remembered that all the successful works of this character in the world (of which there are many instances, and some of them over a hundred years old) are jetties that are high enough to conserve the flow which they seek to direct upon the bar, and they are also high enough to prevent sand from being transported over them into the channel, and to prevent their being destroyed by the overfall of waves that would burrow beneath them. It is a great mistake to suppose that mere sand is a compressible base. The trouble with sand is that it is a movable base. In the report of 1880 the board say there is no more trouble here than on the bars of New England, that rubble would easily stand, and they give a cut of the shape it would take. When the foolish man built his house upon the sand, he had no trouble about the sinking of the sand; it was only when the rain descended and the floods came and the winds blew and beat upon the house, that it fell, and great was the fall thereof—as was the case with the gabions, and as is the

case with much of our sea-work at other places; which, however, I have not time to go into now. They deny that these jetties are to be submerged. If you will look on page 1229, report of 1880, you will find these words:

It has always been assumed that the Galveston jetties are to be submerged.

And it goes on to say that "an average height of five feet above the sand" may "prove sufficient." This is signed by General Newton himself.

Now, as for Major Mansfield upon this point. Turn to page 1211, same report. This language is dated in July, about a month after the board had given its counsel, and is sent to Congress in the following December, as the conclusion of things. It is by Mr. Ripley, an assistant to Major Mansfield. And on page 1206 Major Mansfield says he is indebted to him for "so clear and comprehensive an exposition of our plans." The report says:

The accompanying tracings show the form and position of each jetty. The south jetty * * * commencing at the inner end for 4,080 feet the top is five feet below the water. From this point it "slopes up to the water surface," and it never does get substantially above it.

The north jetty amounts to the same thing.

Now, if you want an earlier expression upon this point, see page 733, part 1, report of 1874. Captain Howell, the officer in charge, says:

They may be called submerged jetties, since they will not, except on a short portion of their lines, be built up to the plane of mean low tide, while for the greater part their tops will be five or six feet below that plane.

General Newton concurred in the report of that year that took no exception to this, but expressed the opinion that if the "piers proposed" were constructed the depth would be increased "in an important degree." Yet these gentlemen tell us that these jetties are not to be submerged. Pray, when and where and by whom have they been changed? Shall we look to the last report of all? I mean the last report of the board. Then see page 1454, report of 1882. It says:

We advise that the jetty be almost if not wholly submerged, as originally intended by Major Howell.

And they speak of no part showing its head except "the outer ends."

This language also is signed by General Newton, along with the other members of that board. And yet these gentlemen in question, who are our presumed hope, guides, and support—the ones that suffering commerce and a languishing State all look to—they come and certify such things to us, as if we would never look up their past reports, but would go on suffering forever, and forever sustaining them with the people's millions in wretched experiments that the great marine engineers of the world tell us are but child's play. It is in vain for these gentlemen to talk about this as a mere personal question, when the commerce of the country is suffering, or to denounce honorable merchants as "mercenaries," or an honorable and eminent American as being allied with such despicable characters, when they are failing in argument, failing in works, and even failing in statements of fact. I have been astounded at these proceedings.

I have been astounded at seeing a high officer of the Government certifying such gross inaccuracies to Congress, and so far forgetting himself as to indulge in billingsgate and slander toward a man and a set of eminent gentlemen who command the respect of all who know them. It has frequently been remarked with us that this at least seemed to be one project where all the lobbyists were left out, much, apparently,

to their chagrin, and only plain, honest, earnest argument was employed, headed by such eminent gentlemen as our chairman of the Commerce Committee [Mr. REAGAN] and the other able and distinguished members from Texas and the eminent Senators from that State, a delegation, as a whole, that is an honor to our country.

And now, sir, I come to another feature that has lessened my confidence in the present administration of this work, and which helped to make me conclude that we need to employ some one else if we do not mean to mock the sufferings of 2,000,000 of people. On page 217, part 1 of the last report, the Chief of Engineers, General Newton, says the estimate of 1880 "contemplated the obtainment of a channel across the outer bar of *at least twenty-five feet deep.*" The last words are in italics. Now, sir, there are two reports from the board in 1880, and both of them are signed by General Newton. One is dated New York, June 7, of that year; and on page 1221 of the report of 1880 you find it stated that the project they had been working under, with Major Howell in charge, contemplated "deepening the outer or Gulf bar from twelve to eighteen feet, possibly." No other contemplated depth is mentioned in the report of the board.

The other reports are the same way. Where then does the Chief of Engineers get his authority for making that statement to Congress? As a member of the board he has uniformly stated the contrary. There is, however, a place where he gets it, and it carries a moral with it. You will find on page 1214, report of 1880, a statement by Major Mansfield's assistant, Mr. Ripley, regarding the effect of the jetties he proposes. He says: "We should look with confidence for an extreme depth of not less than twenty-five feet." This is the only place in all the reports, from the beginning in 1873 down to this time, where any such mention is made. But General Newton says, on page 8, in his letter to our committee, that "these reports have no other value save the authority of their authors." He further says that they are "without any sanction from the proper authority." Is the prophecy of this humble assistant of any "value" to him now? Has it "sanction from the proper authority?" Go back through all the "proper authority" and the maximum purpose stated anywhere is "possibly eighteen feet." How is this to deal with Congress? What hope can we have here?

I showed before that the report of Major Mansfield was what was sent to us for our guidance. He says on page 1206, once quoted, that this report of Mr. Ripley's is "a clear and comprehensive exposition of our plans." Now the Chief of Engineers adopts it, and let us see how he proposes to give us "at least twenty-five feet" of water.

Look at the chart, which is a part of the report, and is signed by Major Mansfield in official form, and look at the text on page 1211 and following:

The south jetty has a total length of 15,330 feet, and extends from the 6-foot contour at its inner end to the 13½-foot contour at its outer end. Commencing at the inner end, the top for 4,080 feet is 5 feet below the water surface.

* * * * *

The north jetty has a total length of 8,090 feet, and extends from the outer end of the Bolivar gabionnade to the 12-foot contour across the bar.

We all know the history of those submerged gabions. Now, sir, here are these submerged jetties 12,200 feet apart—over two and a quarter miles, going scarcely to twelve feet depth, and they, according to this last complexion, are to give us "at least twenty-five feet" of water. Sir, comment is unnecessary.

But the humble assistant and the officer in charge, even when their reports are sent to us professing to be the plan, and that not dissented from by the Chief of Engineers in his accompanying report, are not "the proper authority." Are they "proper authority" now? Pray who is managing this business? The board says on page 1229, report of 1880, in speaking of these jetties:

Neither, however, should be carried more than two miles seaward until the other has progressed nearly an equal ratio.

On page 1214, same report, the local engineer says:

There can be no doubt, therefore, that the south jetty is the important one, and should be constructed first.

Now which has been done? There has been constructed nearly four and one-half miles of the south jetty and not a foot of the north jetty, unless it be a trial section. Was this according to the plan? Was it by authority?

The map of 1880, says General Newton, page 8 of letter, was a "crude idea." They had been at that work for seven years. Was it still "crude?" In 1881 and in 1882 they leave out the north jetty. In 1883 they locate it, he says, in a different position. Now, in 1884 we seem to have another position, suspended out in the sea. Is it still crude? I believe it is more crude to-day than it ever was. It is in an inextricable tangle, and neither plan nor men offer the slightest basis for hope.

Colonel Merrill also quotes from Major Mansfield and says the south jetty has not been completed. This point is important only as additional evidence of the kind of testimony we are getting and of the faith we can have in the way matters are going on. I will dispose of it briefly. (See report of 1883, page 1063.) Here is a letter from Major Mansfield to the mayor-elect of Galveston in regard to what it would take to complete this jetty. Congress had failed to pass a river and harbor bill the previous session. Galveston was willing to borrow money and give it to the work, though of course it concerns the whole State of Texas. Major Mansfield says:

One hundred thousand dollars will keep the work on through the summer, and will effect the entire completion of the south jetty.

He got the money and spent it without trouble or delay to the "entire completion" of this jetty, and yet we have this unqualified statement made to us. All of the jetty had been raised to "its full height," except a 6,000-foot gap. They had concluded to bring the jetty higher than any plan had contemplated, and "the \$100,000 is necessary to close this gap." Then the jetty will be "built up throughout to level of mean low water," which, as stated, was "entire completion." That is enough of this.

Here also Major Mansfield states that he expected this to obtain an 18-foot channel by the following fall, but the only effect of any note was the deepening of a trench on the wrong side of the jetty.

This brings me to the claim now made of the effect of this work upon the channel.

The Chief of Engineers says in his last report that there is "a very apparent improvement in depth over the outer bar."

Major Mansfield says, as quoted here by Colonel Merrill:

The depth of water over the outer bar has been improved so that navigation has been benefited to the extent of about two feet, and this has been accomplished by the Government works, which consist of an incomplete jetty running from Fort Point out to the crest of the bar, a distance of four and one-quarter miles.

Now, the only way to tell what the effect of that jetty has been is to take the depth on the bar at the time it was begun and compare it with the depth on the bar after it is finished. On page 147 of the report for 1880, the Chief of Engineers says:

The appropriation of \$500,000 asked for is to be applied to building jetties of brush and stone directed toward obtaining an improved depth of water over the outer bar, where there is now but twelve and three-quarter feet.

Now turn to page 1301 of the last report, and we see that the present depth is stated at "thirteen feet," and as for any movements that have taken place the past year, they are summed up on page 1298 in the expression:

No benefit to navigation has resulted yet.

And on the same page Major Mansfield himself says:

The depth of thirteen feet at mean low tide in the jetty channel of one year ago has been maintained.

Mr. REAGAN. What is the date?

Mr. BRECKINRIDGE. August 28 of last year. It is the last report we have before Congress. Now, what was the original depth? The original depth was twelve and three-fourths feet, and they have got, as they certify in print here, thirteen feet, which is an increase of just three inches. As shown by their own printed statements it is only three inches, yet these gentlemen report to Congress, and one of them solemnly says, "there is a very apparent improvement in depth over the outer bar," and the other one says it is two feet.

Mr. SPRINGER. What is the difference between depth at low tide there and high tide?

Mr. BRECKINRIDGE. All measurements are calculated at mean low tide unless expressly stated to the contrary. The rise of the tide there is a trifle over a foot.

A MEMBER. Perhaps they made a mistake.

Mr. BRECKINRIDGE. I think they did. The whole thing is a mistake. If they have made a single ordinary mistake they do not explain it. I will say that we have time and again tried to get the Chief of Engineers before the committee to inform us on the subject, but we have never been able to get him there. When we urged him to come—

Mr. WILLIS. I hardly think my friend ought to go that far. General Newton was invited before the committee but replied he was on a court-martial.

Mr. BRECKINRIDGE. I am going to state that. Last year we invited the Chief of Engineers before our committee to give us information, and we were put off by some question of etiquette. I want to state here, as I understand it, and the chairman can correct me if I am wrong, that while we had discussed this question with Captain Eads, the engineer who represented one view, we invited the Chief of Engineers again, and he declined to come, upon the statement that he was on a court-martial that was sitting in the city. Here is a great national work practically in his charge, and a committee of the Federal Congress is considering the matter in a short session; we invite him to meet us, and we are put off in this manner.

Mr. ROSECRANS. He was obliged by order of the Secretary of War to sit on the court-martial, of which the hours are fixed.

Mr. BRECKINRIDGE. If it is not a matter of discretion with him then it is all right. None of us seem to have thought of that. There was no court-martial before. It is doubtless as much our fault as his

that the Secretary of War was not asked to let the court-martial wait a few hours on the wants of Congress. We have tried this two ways and during two sessions, and we must content ourselves with the printed testimony, which I have mainly gone over. I wish to condemn most strongly this whole way of dealing with the public interests.

Major Mansfield is quoted by Colonel Merrill as saying:

This structure is a most substantial one, and is not likely to deteriorate much.

I presume this means that the jetty is in a good state of preservation. I dislike very much to have to contradict that statement. It is very painful to me, as this whole business is, but I have no right to regard my personal reluctance. I hold in my hand the soundings I made on that jetty last autumn, being in company with Major Mansfield himself, and I estimate that not less than 50 per cent., as shown by the soundings on the crest of the jetty after you get a little out from the shore end, is gone. I have the soundings here in my note-book. Major Mansfield accompanied me in an open boat; I did a part of the soundings, and I had one of his employes do the other part of it, I taking down the notes as we went and making a summary statement of the first part. Major Mansfield may be erroneously quoted; but here are the facts, and they are my guide.

Mr. ROSECRANS. Will the gentleman permit a further question?

Mr. BLANCHARD. Let me ask the gentleman first when was that?

Mr. BRECKINRIDGE. It was last fall; in November of last year.

Mr. ROSECRANS. I desire to ask the gentleman (as it is necessary to know in connection with such measurements) from what surface he started?

Mr. BRECKINRIDGE. I took it from the usual surface of measurement adopted by the engineers. The point is that this jetty is stated in this report to have been brought up by them to mean low tide. That you find established on page 1063, report of 1882, and the oral statements also were made to me. Now, I took my soundings at an unusually low state of the tide, and consequently the statement I attack has all the benefits of the elements on its side. I find in my notes this remark: "The pilot says the water was lower than he had seen it in a long time."

Mr. ROSECRANS. Will my friend permit another question? Did you have any means of knowing how that measurement or point from which you measured compared with the bench-mark usually taken as the low-tide mark?

Mr. BRECKINRIDGE. The engineer who accompanied me, and also the marine men acquainted with the facts, informed me that at that time it was unusually low tide. The work had previously been a little out of higher water than that, and I am giving its present depth below a lower surface of water.

Mr. ROSECRANS. But the gentleman knows that there is a bench-mark from which such comparisons are made.

Mr. BRECKINRIDGE. Of course I do not question that. We all know that.

Mr. ROSECRANS. This bench-mark is the datum plane or line. I have had much experience in water measurement, and there may be in such cases a mistake in beginning the measurement from the wrong point, instead of taking a surface point or datum-plane which has been established.

Mr. BRECKINRIDGE. Nothing can effect the practical fact that at

what I was informed was an unusual low condition of the tide I made this sounding on that jetty, which, as we know, had been brought visibly up to the surface of the water and a little above it, and now, at unusually low tide, I found points—there were plenty of places, even then—where a steamboat could run over the jetty, and I have the measurements here to show the facts.

Here they are, running ten, nine, and seven feet under water on the crest, though the average of course is less. When there happened to be a spit of sand we would find it as shoal as three feet, or even eighteen inches; but the outer half of the jetty shows an average depth on the crest of, say, six and one-half feet, with an occasional high point. Near shore it is well preserved, owing to sand there, and to being much higher originally, as shown in the last report, than the other parts.

It is hardly necessary for me to carry this analysis further. I do not believe that there is a single essential statement in General Newton's letter, or in the joint paper from Colonel Merrill and Major Mansfield, that is not as erroneous as these propositions of which I have just treated. This work is but a sample of much that is going on all around the coast. We have made appropriations for other harbors under a species of protest, for we provide a temporary harbor board, to be composed mainly of men not associated with these wretched schemes, most of which assuredly should never have been begun, and that board is to report fully to the next Congress.

I am a plain, business man, and I try to look at things in a plain, common-sense way, and I think that surely there can be no bureau of the Government more sadly in need of reform than this one is. The officers are free from corruption; but there is a thorough unfitness for this work. There is an easy-going, indifferent, unreliable way of doing things that needs to be stirred up and reorganized from the very bottom. The time has come for a change. The people won't stand this. They ought not to stand it. And we need to start a reform here in Congress. We should select proven ability for these works, settle upon works with greater care, and then make adequate appropriations for them. Unless we are going to complete a work in the right way it is a public duty that we should not undertake it at all.

Mr. ROSECRANS. That is right.

Mr. BRECKINRIDGE. And let me say here that this should not be a political bill or a log-rolling measure, or a bill to distribute the public revenues, or anything of that kind. With due regard to the equities it should be a business measure for the improvement of the commerce of our country, with neither Democracy nor Republicanism in it.

Now we propose to employ an engineer second to none in the world, to supply the Secretary of War with money, and to tell him to improve this harbor according to the plans of a man in whom we have confidence. We are not here to do anything for him, but we want to hire him to do something for us. He can make nothing but his \$5,000 a year and his \$3,000 a foot. He has not the spending of a dollar. He tells us the work must be almost entirely of stone or concrete, and he tells us the approximate cost. We find it far less than the estimates of our engineers of cost for an equal extent of inferior work upon the basis of their South Pass estimates, allowing the usual percentage for contingencies. This eminent engineer tells us that there is not a particle of doubt about making the work a success. But he will do it as all the great jetty works in the world are done.

How idle are estimates for the present plan! The work is located wrong to start with. Had this sort of work been located right we have no assurance that we have confidence in that any amount of money thus applied would ever get and maintain a good channel. The sea has destroyed all of the north jetty. The tide and teredo have destroyed nearly, if not quite, one-half of the south jetty. The bar would move seaward if the feeble things were finished, and leave you worse off than before. What is your condition now, after vast expenditures? What would it be in this line if you wasted millions in this way? Colonel Merrill says: "It is quite possible," in speaking of such work, "that one or the other [jetty] might require removal."

The doctrine laid down by Eads is to be sure you have mastered your subject before you begin work, and then push it with all possible speed. General Newton says Hartley's works at the Sulina mouth of the Danube "were eminently tentative in their character." I find the reverse to be the case. The first work was provisional, but the tracings were exactly the same, and when Hartley began his work he pushed out upon his lines with the utmost dispatch. The Dutch works of the Scheur branch of the River Maas, says General Newton, "is a case where heroic treatment has been applied, with the result of an immediate failure." The reverse is true. The treatment was feeble. The jetties were much wider apart than was the cut that supplied water for them; consequently a vast amount of dredging had to be done; and instead of the bar being dispersed by a vigorous current, it was simply turned over by slow degrees to be as bad an obstruction as it was before. They have since imparted energy to the current by adequate contraction.

Now shall we stop this trifling and give these people a harbor? Here are nine hundred miles of coast and not a harbor. Here is the first cotton-growing State in the Union, here is the first wool-producing State in the Union, here is the first cattle-raising State in the Union, here are over 2,000,000 of people, \$120,000,000 annually of farm products, \$1,000,000,000 of the people's wealth, 6,000 miles of railroads carrying their commerce, not to speak of adjacent States, and all are suffering from the lack of a harbor. The entire territory dependent is equal to all of the New England States and New York, New Jersey, Pennsylvania, Maryland, Delaware, Virginia, Ohio, Indiana, Illinois, Michigan, Wisconsin, North Carolina, Kentucky, Tennessee, Iowa, Minnesota, and Nebraska. Shall we give this region a harbor? I say yes, and I call the attention of Congress to the striking fact that from Hampton Roads, almost at the base of the Capitol, to the Mexican line, nearly 3,000 miles, there is only one harbor entrance where a first-class merchantman or a well-appointed man-of-war can float. That is the south pass of the Mississippi River. Pensacola is questionable and uncertain.

Mr. DIBBLE. Will the gentleman from Arkansas permit me to interrupt him long enough to say that Port Royal, on the South Carolina coast, has twenty-six feet of water?

Mr. BRECKINRIDGE. The commerce of that point is so small that I did not remember it. I accept the statement of the gentleman. There seems to be that remote point which has twenty-six feet of water. But take a city like Wilmington or Savannah or Charleston or Mobile. They are all second or even third-class harbors; and our commerce must not be compelled to make the long and expensive hauls to New Orleans and Hampton Roads.

Mr. KING. Twenty-six feet of water does not admit a first-class man-of-war or modern merchantman.

Mr. DIBBLE. The Great Eastern only draws twenty-eight feet.

Mr. KING. In New Orleans a ship drawing twenty-nine or thirty feet can enter.

Mr. NICHOLLS rose.

Mr. BRECKINRIDGE. Do not talk across me. I have no time to yield for further interruption.

Now, Mr. Chairman, there is one other point I desire to discuss—and these remarks are much less complete and much less compact than I would like to make them.

I want to call attention to our action about the Mississippi River Commission. The bill shows that we provide for an advisory engineer for the commission, and we recommend that James B. Eads be appointed to the place, and we require the Secretary of War to carry on the improvement of that river according to the plans, &c., of the commission as the same may be approved or amended by the advisory engineer.

This, too, has been rightly called a radical step. Nothing of an ordinary character could justify us for a moment in taking such a step as this, and it is proper and unavoidable that the House and the country be given the reasons for our course. I will say that it is the result of the most mature consideration and counsel; and at a very full sitting of the committee, after long and protracted discussion, all present agreed to this step except my friend from Pennsylvania [Mr. BAYNE]. I do not consider it necessary to reply to the dissenting argument my friend has made. It needs no reply. It is proper to say that my friend from West Virginia [Mr. GIBSON], who also dissents, was not present at that meeting. His speech needs no reply. I can not but hope that had he been present and participated in our lengthy and earnest proceedings he would have concurred in our general purpose. But of course this is conjectural.

I will try to explain the reasons for our decision.

This commission was organized under an act approved June 28, 1879. It was composed of seven members: Col. Q. A. Gilmore, president of the commission; Maj. Charles R. Suter, Maj. C. B. Comstock, all of the Engineer Corps of the Army; James B. Eads, and B. M. Harrod, civil engineers, and Hon. Benjamin Harrison, now a Senator from Indiana. The *personnel* has somewhat changed—Mr. Eads has gone out, Mr. Harrison has gone out; but I need not dwell upon that. In plain terms, they were to take charge of the whole question of the improvement of the Mississippi River from Cairo to the Gulf. Their jurisdiction is now somewhat enlarged. The idea of a board or commission for this vast and vital business was and still is a wise one.

After long and mature consideration the commission agreed upon a plan for the improvement of the river. That plan is set forth in their first report (Senate Executive Document No. 58, second session, Forty-sixth Congress, and dated March 6, 1880). The report treats with great clearness of the philosophy of the case, and it lays down a plan of work in conformity thereto, reciting successful practice. It is not necessary for me to recite the accompanying dissenting report of Major Comstock and Mr. Harrison, for they concur in the general features and only dissent in "some less important points." This plan has received the approval of Congress and the country. This is evinced by several appropriations by Congress, aggregating over \$8,000,000, which, with the

appropriation in this bill, will amount to over \$11,000,000. I do not include anything above Cairo. The people have applauded this; executives have recommended it, and both political parties in national convention have pledged themselves to the continuation of the work.

Now, sir, what is the plan to which we have pinned our faith, and of which we have no reason to doubt? I can best state it by reading extracts from the first report of the commission. On page 16 it says:

It has been observed in the Mississippi River, and is indeed true of all silt-bearing streams flowing through alluvial deposits, that the more nearly the high river width, or width between the banks, approaches to uniformity, the more nearly uniform will be the channel depth, the less will be the variations of velocity, and the less the rate of caving to be expected in concave bends. * * * Uniformity of width secured by contraction will produce increased velocity, and therefore increased erosion of bed at the shoal places, accompanied by a corresponding deposit of silt and deep places, and consequently greater uniformity of depth.

Uniform depth joined to uniform width—that is to say, uniformity of effective cross-section—implies uniform velocity, and this means that there will be no violent eddies or cross-currents, and no great and sudden fluctuations in the silt-transporting power of the current. There will, therefore, be less erosion from oblique currents and eddies, and no formation of shoals and bars produced by silt taken up from one part of the channel and dropped in another.

The work to be done, therefore, is to scour out and maintain a channel through the shoals and bars * * * and to build up new banks and develop new shore lines, so as to establish, so far as practicable, the requisite conditions of uniform velocity for all stages of the river.

This improvement can be accomplished below Cairo by contracting the low-water channel way to an approximately uniform width of about 3,000 feet, * * * by causing, through the action of appropriate works constructed at suitable localities, the deposition of sand and other earthy materials transported by the water upon the dry bars and other portions of the present bed not embraced within the limits of the proposed low-water channel. The ultimate effect sought to be produced by such deposits is a comparative uniformity in the width of the high-water channel of the river.

These constructions will commonly be open or permeable to such a degree that * * * they will sufficiently check the current to induce a deposit of silt in selected localities.

I could cite more, but this is enough. I will add, however, that another important feature was the closure of outlets of which the Atchafalaya was perhaps the most important. It was agreed to at once stop the enlargement of that outlet, but not to take further action until the report of Major Benyaurd, who was then making a survey of it, should be received. The estimated cost of the first step was \$10,000.

I will now turn to the second report of the commission (there was another report the meanwhile, which, however, relates principally to other matters), which is dated November 25, 1881, and begins on page 2745 of the report of the Chief of Engineers of that year. In this report the commission shows that it has not silled the Atchafalaya, and it continues to promise that the initial step shall be taken. Running through the whole report there is a confusion of thought, and therefore I turn to the report of Mr. Eads, which accompanies the report of the commission, for a plain and clear restatement of the original plan of improvement. Mr. Eads, I believe, was also the author of the first report.

Mr. ROSECRANS. Did I understand the gentleman to say that the author of the first report was Captain Eads?

Mr. BRECKINRIDGE. It is so stated.

Mr. ROSECRANS. I wish to say that I have known that all along since I have known anything about engineering, and it is good sense.

Mr. BRECKINRIDGE. I will not go over Mr. Eads's reasoning about the Atchafalaya, in the course of which he urges most strenuously that immediate action be taken toward the closure of that perilous outlet, and says that the closure should be completed in "six years," so as to restrain "about one-sixth of its volume per annum." This general subject is also treated with the greatest clearness and ability in the report signed by the gentleman from Illinois [Mr. THOMAS] and the gentleman from Louisiana [Mr. ELLIS]—in their report accompanying the Burrows report. These two papers are masterly and complete, and no thoughtful man can read them without concluding that advocates of the "outlet" theory are among the most mistaken of men. There is no proposition more opposed to numberless facts, more inconsistent with reason, or more universally condemned by all classes of engineers. But Mr. Eads, in summing up the adopted plan on page 2775, says:

The plan of improvement recommended by the commission differs from any other previously proposed for the correction of the channel in the fact that it looks to a rectification of the high-water channel by the ultimate narrowing of these wide places as the *only* method by which a deep and uniform low-water channel can be permanently secured.

The wide places in the high-water channel create alternations of current velocity and steeper slopes to overcome the excessive frictional resistance. These cause the water to be highly charged with sediment at one part of its journey to the sea, and much less highly charged at others. This creates scouring and depositing in the bed, and radical changes in the channel by the caving away of its banks.

By reducing these wide places to a width approximately the same as that of the narrow parts of the river the friction is reduced, a lower slope and uniform depth will be obtained, and the velocity of current will not be subject to its present changes. A uniform charge of current will result from uniform current velocity, and the caving of the banks will then be practically arrested for the reason that when the water has the full charge of sediment due to its velocity it can carry no more, and can not, therefore, scour the channel more deeply, by which the undermining of the banks is effected.

Permanence of channel will not, therefore, be secured until these excessive widths are reduced. A less depth at low water than twenty feet will not insure stability of channel, for the reason that a less depth will result from only a partial reduction of the wide places. Permanence of channel will be attained only in proportion as uniformity of width of the high-water channel is attained, and when this is secured the depth at low water may be considerably more than twenty feet, but it will certainly not be less. The sooner these wide places are corrected the less will the improvement of the river cost.

* * * * *

There can be no doubt of the entire feasibility of so correcting the Mississippi River from Cairo to the Gulf that a channel depth of twenty feet during the low-water seasons can be permanently secured throughout its entire course.

Upon the basis of this plan the commission estimated, on page 2752 of report of 1881, that the entire cost of improving the six reaches from Cairo to Red River, one hundred and eighty-four miles, would be \$8,226,000, and for the entire river to that point \$33,000,000. There was no material dissent from this.

After this the breach between Captain Eads and the majority of the commission further widened. Captain Eads contended for a faithful adherence to the plan and doctrine laid down, while the majority of the commission seemed unable to realize the fixed laws of nature; they never seemed to clearly grasp the problem in hand, and they varied and dallied as men often do in controversy and when they immediately confront a question too great for them the principles of which in calm moments they clearly admit.

The very simplicity of the great question seems to baffle them. They failed to grasp the central facts and ideas. The result of this was that Captain Eads afterward resigned from the commission, it being an open

secret that he did so in order to escape the responsibility of errors which he had clearly pointed out but could not avert. He did not participate in the proceedings of the commission after the report I have quoted from. The country did not appreciate the force of the weak tendency that had set in, and I know that it was only near the close of the last session of Congress that, for my own part, I became fully aware and seriously alarmed at the course the commission was taking.

It then began to appear plain to me that the commission was radically and fatally departing from the plan of work we thought they were pursuing, and I have since studied the reports with greater care than before, and I have renewed my examination of most of their work. This departure has been a growth. It has been like increasing weakness, until now the present report comes to us and it contains plans and statements that must be squarely met by all who have real convictions or any high purpose in connection with the river.

I will trace this matter. In the next report after the one I last read from, that is, in the report for 1882, after Eads had ceased to take a part in the proceedings, you find in a paper from Professor Mitchel, a member of the commission, a gentleman looked upon as simply a technical adviser, the following language on page 263:

Indeed, under the general rule that the bars form at the reversion points of curves it is evident that their position must vary as these curves vary, and that the holding of the curves by revetment or otherwise is an essential early step in the control of the river. It antedates logically the retrenchment which is to deepen the water at the bars.

This is a new doctrine. It is true it is put in an obscure place, and in very small print; but it comes, as by request, from one of the commission, and it seems as if they are seeking a new conclusion.

We had previously been told that to narrow these wide and shoal places by silt-arresting works was the *only* method by which a deep and uniform low-water channel can be permanently secured.

Of course this was to be in connection with high-water treatment.

We were also told that—

The wide places in the high-water channel create alternations of current velocity, &c.

And then that—

This creates * * * radical changes in the channel by the caving away of its banks.

We were told that—

Permanence of channel will not, therefore, be secured until these excessive widths are reduced.

And that when we properly reduce these excessive widths where the bars are then—

Uniform depth will be obtained and the velocity of current will not be subject to its present changes.

When that is done—

A uniform charge of current will result.

And that—

The caving of the banks will then be practically arrested.

This stands to reason, and it has never failed in all its numerous practice. The professor loses sight of the cross-over bars in the channel, where you find from five to fifteen feet of water, while in the caving bends the water is, say, one hundred feet deep and often deeper. These submerged bars always join the lower and the upper ends of the dry bars, and they are not "at the reversion points of curves;" but they

form just where the river passes the sustaining wall or bank that has been caving and spreads out and unloads at this wide and sluggish point in floods preparatory to running with increased and destructive velocity into the next bend below. This is the bar that causes the mischief. This is the bar that was to be "scoured out" by contracting the dry bars just here and at their other parts as additional aid as the "only" method by which the river could possibly be improved. Now, this contraction upon these wide bars is to be preceded by something else.

If the Mississippi River were dry and you started in a buggy to drive down its bed from Cairo to the Gulf you would have a very up and down hill road to travel. In places you would be in a deep and narrow gorge, and again you would be upon a hill-top, nearly up to the brink of the bank, and a broad expanse of sand would stretch out perhaps for miles on either side of you. You would then be up on a sand-bar, while your previous position was where there had been a caving bend. Now, suppose this bed be filled again with a great flood. You readily see that when the water gets to the broad and shallow bar it spreads out and loses a part of its velocity.

The velocity is also diminished by the friction opposed to the water by this vast exposure of bottom surface. A part of the sediment that the river was able to carry before it was thus retarded by dispersion and by friction is of course at once dropped to the bottom. Thus the bar goes on building down-stream, adding below what may be picked up at its head. But the water has a certain distance to fall before it reaches the Gulf, and it will make up for this almost no surface slope upon the bar by plunging headlong into the bend below, and in its new course it will pick up a new load of sediment from the bottom. This destroys the repose of the bank, and as soon as the sustaining pressure of the water is taken from the side of the bank by the falling off of the water the bank will begin to cave in. They are land slides.

This new load of sediment will not be dropped until another wide place is reached, at which the river will again spread out and the same operation will be repeated, this new bar causing the same trouble below it that the previous bar has caused just above. Wide places and sand-bars are exchangeable terms. I repeat that the cure laid down for this trouble is to remove the cause. That is to say, you will erect contraction-works at the wide places so as to bring the river at that point to its normal and proper width. Then the river may want to spread, but you will not let it. If you do not let it disperse then it can not drop its load of sediment. If it is kept loaded, then it can not take up any more load when it gets into the next bend. As I said before, the slope of the surface of the water is nearly level on a bar. As soon as it gets over the bar the slope of the water is steep compared to what it was on the bar, and of course the current is correspondingly swift.

But you will soon make the water cut out the bar, and you then not only send the current loaded into the bend, but you also, by the removal of the bar, have deprived the current of the cause of its excessive velocity. You have then brought about a general state of uniformity. Then it is that "the caving of the banks will be practically arrested." What revetting you then must do will be only an incident, and easy to do. A good deal of this sort would be needed; but it will be easy to do, and comparatively inexpensive.

If it be said that the works are imperiled, I reply that you are putting them where the river is constructive and not destructive. You treat the river at its lazy parts and help it to follow its natural bent.

This then was to be done by proper contraction at the excessively wide places. The constructions for this purpose were to be "commonly open or permeable" so that they will sufficiently check the current to induce a deposit of silt in selected localities. They were to effect "the deposition of sand and other earthy materials transported by the water upon the dry bars and other portions of the present bed not embraced within the limits of the proposed low-water channel."

This is what was to be done, so that the water would be made to remove the bars, the cause of the caving, for surely we can do nothing unless we can hold the banks. The question is how are they to be held and how can they be held? These works would promptly "scour out and maintain a channel through the shoals and bars."

Now, however, they are not going to effect a cure by removing the cause, but by treating the effect. Indeed they have changed their views as to what is the cause. We shall see later on how futile it is to go into the teeth of the river in this way, and then we can better judge whether or not we ought to permit the commission to commit us to this change of plan.

What I have read from Professor Mitchell's paper prepares us to expect the expression in the main report, page 11, "the main item of cost will of course be the bank protection." This was the only prominent intimation then of these growing errors. It is very forcible in the light of later events.

And so matters go until near the close of last session we had the commission before the River and Harbor Committee. It is sufficient to say that their influence with the committee was much greater before we heard them than it was afterward. Soon after that we were startled with the information that the extensive revetment work at Memphis and in Hopefield Bend was a total loss, and that great city was in imminent peril, with the vital interests of the vast commerce that seeks its facilities in equal danger. We found that the entire work there had been upon this new plan. Last session Congress gave \$200,000 for the emergency, and we find that it too is being spent in the same way. Not a dollar has been or is being spent to remove the cause of all this trouble; that is, the bars above. They revet where the water is one hundred and one hundred and five feet deep, while just above lie the fatal bars, with some eight and twelve feet of depth.

The current continues to come upon them with unabated fury, stripped of its load and ready for the fray, and poor obstinate man stands there fighting the laws of God.

Why not conform to nature and seek her potent aid? Is it because their great rival told them what to do and they are unwilling to learn? Are the public interests to suffer for this? Eads told them the truth. He understood the case. It is not Eads we are fighting for or the commission we are fighting against. It is the engineering truth we want, and he happened to understand it and these gentlemen do not. We are pressing forward for the public interests. Men must stand the consequences of their errors, and pique and pride can no more control the Mississippi River than could Canute, by waving his feeble scepter, cause the tide to recede. The plain Dutch have done with their sea-works what his majesty could not achieve.

Look further into their last report. You find estimates for various harbors on the river, aggregating \$2,014,000, and every dollar is for revetment. You find on page 4 that they propose a systematic course of revetment for the bends from Cairo down. This they propose to do

and to let the river scour out its bars, &c., by natural agency, aided only by revetment instead of proceeding in the line of nature's work. This work, as is clearly deducible from their estimates, will cost at the least over \$130,000 a mile, including plant, while from what they are now trying at Memphis I think the estimate may be more safely put at \$30 a foot than at \$20, if it is to be carried to the maximum depth, and we have scarcely a hope of stability short of that. The same policy is largely practiced in the reaches under treatment. They estimated in 1880 that, say, \$1,250,000 would complete Providence reach, and they have now spent, say, \$2,000,000 on it, and the report says as much more is required.

For Plum Point reach they estimated less than \$1,500,000, and they have spent over \$2,000,000 on it, with the intimation of spending in all \$4,000,000, with no limit then fixed. For one of the commission says, on page 32, that they will spend three times the original estimates on these reaches, and then the final sum is undetermined. The Atchafalaya is not even silled yet, and to-day the whole North is in grave danger of being cut off from the Gulf, and New Orleans is in grave danger of being cut off from the North. All this is the result of deviations from the adopted plan. There is a grave duty for us to discharge here. Can we permit this? Is there a gentleman here who ever dreamed of permitting these deviations from the adopted plan for treating the river? Can we countenance them for a moment by look, or word, or vote? How are we to act as custodians of the public funds and of this grand river? I expect accidents. I can pardon errors; but I can not condone this radical, fundamental, foolish, and ruinous change of policy.

Gentlemen, it must be done openly. It can not be hid in a corner. The plain way, the honest way, and the manly way is the only way. We must rebuke those who deserve it. We must in every way merit the confidence of the country. The country has given and will give freely of its money. They ask only frankness and candor of us. Can you fail to stop these departures? Can you ask money for these wretched experiments? Have you a particle of doubt of your true plan? The former offers untold expense and no results. The latter is reasonable in amount and has never failed. Where contraction has been only partially completed the results are perfect to that extent. Of course, enemies to the West, the special pleaders of Eastern railroad corporations, will pervert the truth and seek to take advantage of our candor and of our dilemma; but we can not help this, and they can not fool the House or the people.

This is the condition in reports and from observation. We must make them go back to what we have confidence in. They must stop this ceaseless revetting and first remove the bars which are the chief cause of the trouble. You never find a caving bend but what there is a bar above it. You never find a caving reach but what there is a bar in the middle and a surplus channel to be closed.

Mr. ROSECRAWS. Will the gentleman permit an interruption?

Mr. BRECKINRIDGE. Pardon me; I have only a moment left.

The statements I make are plain in the proof.

[Here the hammer fell.]

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